

Black Sprayable Molecular Adsorber Coating Project

Completed Technology Project (2011 - 2011)



Project Introduction

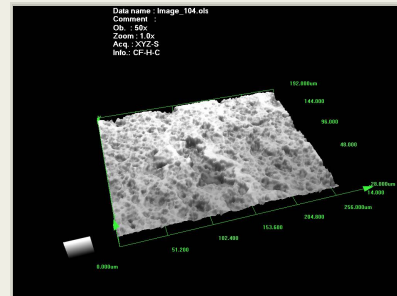
The main objective of this technology project is to develop, optimize, and flight qualify a black version of the molecular adsorber coating and a conductive version of the coating that can be used by contamination sensitive flight projects to control outgassed effluent, reduce hardware bake-out times, lower internal pressure for high voltage sources, and provide thermal control. This novel molecular adsorber coating would alleviate the size, weight, and complexity issues of traditional molecular adsorber puck, while providing a cost effective format that projects can more easily utilize, particularly contamination sensitive instruments. A flexible tape version is also being developed. The white formulation of the molecular adsorber coating has been qualified to TRL 6 for possible flight project infusion.

This novel molecular adsorber coating would alleviate the size, weight, and complexity issues of traditional molecular adsorber puck. A flexible tape version is being developed. The white formulation of the molecular adsorber coating has been qualified to TRL 6 for possible flight project infusion.

Anticipated Benefits

There is a tremendous need for this flight qualified electrically conductive, black, high capacity molecular adsorber system. All current and future NASA programs will benefit. The coating will be advantageous in reducing subsystem hardware blackouts, reducing detector cycling, preventing high voltage arcing, eliminating costly material selections, improved instrument performance, and lengthening mission operations. In addition, this adsorber will dramatically reduce mass and volume restrictions and is much less expensive than the puck design. The cost is equivalent to applying thermal coatings on flight hardware. If successful, this type of coating could become an industry standard on interiors of spacecraft and instruments, as an alternative to thermal control paint. It is expected that this coating will be ready for infusion into flight projects by the end of the fiscal year. Studies are being performed on the molecular adsorber coating to adsorb radiation, as well as contaminants, to improve performance of future cryogenic infrared instruments. With respect to ground based applications, the coating can be used to improve performance of vacuum systems, as well as adsorb contaminants in optical coating life tests. Additionally, progress made on the white version of coating has been highly successful. GSFC is the only identity developing space-grade molecular adsorber coatings. A patent has been filed for the white version of the molecular adsorber paint.

This coating has many potential uses in agencies and industries with ground and space based applications utilizing vacuum systems, lasers, contamination sensitive systems, high powered electronics, contaminant collection,



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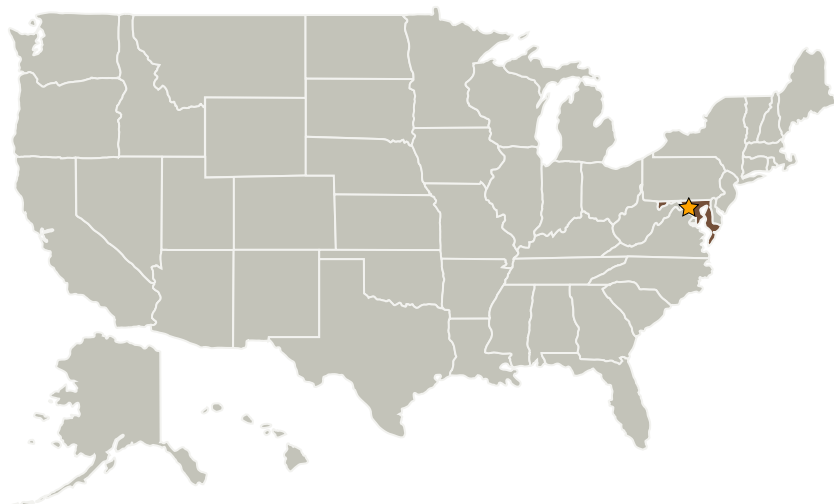
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pharmaceuticals, gas adsorption, and food processing.

Primary U.S. Work Locations and Key Partners



Organizations Performing Work	Role	Type	Location
★ Goddard Space Flight Center (GSFC)	Lead Organization	NASA Center	Greenbelt, Maryland

Primary U.S. Work Locations

Maryland

Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Center / Facility:

Goddard Space Flight Center (GSFC)

Responsible Program:

Center Innovation Fund: GSFC CIF

Project Management

Program Director:

Michael R Lapointe

Program Manager:

Peter M Hughes

Project Manager:

Theodore D Swanson

Principal Investigator:

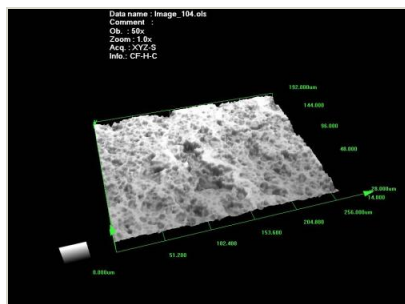
Sharon A Straka

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Images

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(<https://techport.nasa.gov/image/3063>)

Stories

Molecular Adsorber Coating

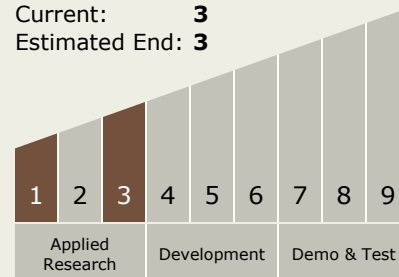
(<https://techport.nasa.gov/file/24300>)

Project Website:

<http://aetd.gsfc.nasa.gov/>

Technology Maturity (TRL)

Start: **1**
Current: **3**
Estimated End: **3**

**Technology Areas****Primary:**

- TX12 Materials, Structures, Mechanical Systems, and Manufacturing
 - TX12.1 Materials
 - TX12.1.5 Coatings